

PH 101: Mechanics

Quiz 2 — Kinematics & Momentum

Duration: 30 minutes Maximum marks: 12

SET B

Name: _____ Roll No.: _____

Instructions

- Write your name and roll number before starting.
- This paper has 6 questions in 3 parts, for a total of 12 marks.
- Record your final MCQ answers in the answer grid below — the grid is what gets graded.
- Take $g = 10\text{m/s}^2$ unless stated otherwise.

MCQ Answer Grid

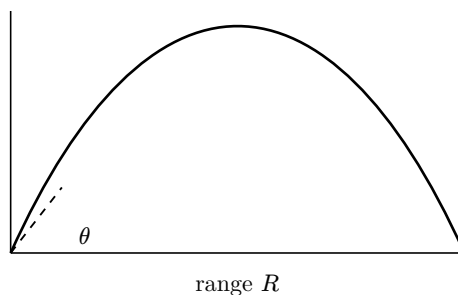
Q	1	2	3
Ans			

Part A — Multiple Choice

6 marks

- Q1.** A ball is dropped from rest from a height of 20 m. How long does it take to reach the ground? [2 marks]
- (A) $\sqrt{2}$ s
(B) 4 s
(C) 1 s
(D) 2 s
- Q2.** In a perfectly **inelastic** collision, which quantity is generally *not* conserved? [2 marks]
- (A) Total energy
(B) Kinetic energy
(C) Mass
(D) Linear momentum

- Q3.** A projectile is launched over level ground with fixed speed and launch angle θ (air resistance neglected). [2 marks]



Which θ maximizes the range R ?

- (A) 60°
- (B) 45°
- (C) 90°
- (D) 30°

Part B — Fill in the Blanks

2 marks

- Q4.** “For every action there is an equal and opposite reaction” is Newton’s _____ law. [1 mark]
- Q5.** The SI unit of power is the _____, equal to one joule per second. [1 mark]

Part C — Short Answer

4 marks

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- Q6.** Starting from $v = u + at$ and $s = ut + \frac{1}{2}at^2$, derive $v^2 = u^2 + 2as$. [4 marks]

— End of paper —